

I.C.T. OPTICAL PRINT QUALITY MONITOR1. Design Considerations

The instrument has been designed specifically for O.C.R. applications. Design philosophy has been continually under review as standards proposals have become more clearly defined and changes introduced to keep abreast of the requirements.

The aim is to measure as many of the specified parameters as possible, with quick and easily interpreted results, at a reasonable cost.

2. Principles of Operation

The light source is a scanning Cathode Ray Tube, with controlled light output focused by a lens onto the document platform. A photo-electric detector receives the reflected light signal and converts it into an electronic waveform which is fed to the processing unit. The manual calibrated controls set the desired discrimination levels for the processing unit and the resultant signals are reformed and presented as a magnified image, of the sample, on the display Cathode Ray Tube. Measurements are then carried out against the calibrated graticule.

3. Reflectance Scales

The continuously variable controls and selector switches allow any of the following scales to be used.

1. Absolute scale - 100% = Mg.O. White
0% = Absolute Black
2. Normalised scale - 100% = Paper White
0% = Any absolute reflectance set by 1.
3. PCS scale - 100% = Absolute Black
0% = Paper White

4. Resolution and Magnification

The scanning spot size is set so that 90% of light emission is contained within 0.2 mm. (0.008 in.).

The field width is scanned by 125 lines and the display size is 7 cm x 5 cm. (2.75 in. x 2 in.).

Field size is set for the font size as follows:

SIZE	ASA. Size	Field Height		Field Width		Magnification
		mm.	in.	mm.	in.	
I	A	3.5	0.14	2.5	0.1	20
II	-	4.0	0.16	2.8625	0.115	17.5
III	B	4.65	0.186	3.3125	0.125	15
IV	C	5.6	0.224	4.0	0.16	12.5

These field sizes will comfortably contain the characters and each size is magnified to give maximum utilisation of the available display tube area.

If the user wishes to change the field size he must call in the field engineer who will check the CRT phosphor and recalibrate the instrument.

5. Use of Instrument

5.1. Routine checking of print density and dimensions.

5.1.1. Procedure

- (i) The document is placed in the holder with the character to be examined in the alignment aperture.
 - (ii) The holder is closed on to the document platform causing the character to lie in the scanned field.
 - (iii) The appropriate scale is selected and the potentiometer set to the desired density level.
- NOTE: The display now shows all field elements darker than the potentiometer setting as black and lighter elements as white.
- (iv) The character is now checked against the minimum outline on the graticule.
 - (v) Reset potentiometer to new specified level and check against the maximum outline.
 - (vi) Remove document.

5.1.2. It will be noticed that the character outline is defined as the locus of points of the desired density level. Spots and voids can also be checked at the appropriate levels.

When no document is present an accurately engraved object is displayed on the screen giving continuous monitoring of dimensional accuracy.

Light output of the scanning CRT is held constant by the light feedback loop and only needs checking weekly against a calibrated substandard.

5.2. Detailed Measurements

The instrument may be used to measure the density, on any of the scales, of any part of the character field. This combined with a measuring graticule calibrated in thou. or mm. provides a powerful range of flexibility.

Parameters that may be measured quickly include:-

- | | | |
|----------------------|---|--|
| 1. Paper whiteness | } | Absolute scale |
| 2. Paper blemishes | | |
| 3. Print reflectance | | |
| 4. Image dimensions | } | At appropriate levels
on appropriate scales |
| 5. Extraneous inking | | |
| 6. Voids | | |
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